[SS-03] Population Model of Main Belt Asteroids by Debiasing Method

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Understanding the inner solar system's evolution requires the study of the main asteroid belt structure and the population of asteroids. This is also necessary in order to estimate the probability of asteroid collisions with Earth. We are trying to build a four dimensional asteroid population model, i.e. functions of semi-major axis, eccentricity, inclination, and absolute magnitude, on a large set of observational data from major survey programs. All asteroid survey observations, however, are subjected to very severe observational biases. These biases originate not only from the asteroid orbits in relation to Earth's location, but also from the luminosity function and the distribution of observed angular velocity on the sky plane. We carefully define the bias function for each major survey program based on the observational data and pointing history kindly provided by the Minor Planet Center. Our study is based on the data from LINEAR, Catalina, SPACEWATCH, etc between 2003 and 2008. This is by far the largest data analyzed together for this purpose. Interim results will be reported for observational bias functions and populations of main belt asteroids.

[SS-04] The Interplanetary Dust Cloud Revealed by AKARI IRC All-Sky Survey Observations

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The AKARI's all-sky survey in six wavebands provides us with a priceless set of data for studying the global and local structures of the interplanetary dust cloud complex. We are currently analyzing the 9 and 18 μm band data taken by the Infrared Camera aboard AKARI. The zodiacal emission (ZE) dominates the sky brightness in these bands. This talk details the data reduction procedure and presents the resulting maps of the ZE brightness distribution. A careful comparison of the observed ZE maps with the ones synthesized with the model of Kelsall et al. (1998) suggests needs to revise their dust density profiles of the IRAS bands. We also found that the seasonal brightness variations of the north and south ecliptic poles cannot be fully reproduced by currently available models of the interplanetary dust cloud. Fourier-filtered brightness maps are prepared to resolve small-scale structures in the ZE distribution near the ecliptic plane. These will reveal new features of the faint dust bands discovered by Infrared Astronomical Satellite.